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**Importation of Fresh *Cichorium endivia* and *C. intybus* for Consumption From Ecuador and Nicaragua
into the United States**

Qualitative, Pathway-Initiated Pest Risk Assessment

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A. Introduction

This pest risk assessment was prepared by the Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture (USDA) to examine plant pest risks associated with the

importation into the United States of fresh *Cichorium endivia* (chicory root, escarole) and *C. intybus* (endive, radicchio) grown in Ecuador and Nicaragua. This is a qualitative pest risk assessment, that is, estimates of risk are expressed in qualitative terms such as high or low as opposed to a quantitative risk assessment which expresses risk in numerical terms such as probabilities or frequencies.

International plant protection organizations (e.g. , North American Plant Protection Organization (NAPPO) and the United Nations Food and Agriculture Organization (FAO) provide guidance for conducting pest risk analyses. The methods we used to initiate, conduct, and report this plant pest risk assessment are consistent with guidelines provided by NAPPO and FAO. Our use of biological and phytosanitary terms (e.g. , introduction, quarantine pest) conforms with the *NAPPO Compendium of Phytosanitary Terms* (NAPPO 1995) and the *Definitions and Abbreviations* (Introduction Section) in *International Standards for Phytosanitary Measures, Section 1--Import Regulations: Guidelines for Pest Risk Analysis* (FAO 1995).

Pest risk assessment is one component of an overall pest risk analysis. The *Guidelines for Pest Risk Analysis* provided by FAO (1995) describe three stages in pest risk analysis. This document satisfies the requirements of FAO Stages 1 (initiation) and 2 (risk assessment).

The Food and Agriculture Organization (FAO, 1995) defines "pest risk assessment" as "Determination of whether a pest is a quarantine pest and evaluation of its introduction potential". "Quarantine pest" is defined as "A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled" (FAO, 1995; NAPPO, 1995). Thus, pest risk assessments should consider both the likelihood and consequences of introduction of quarantine pests. Both issues are addressed in this qualitative pest risk assessment.

This document presents the findings of our qualitative plant pest risk assessment. We have not described in detail our assessment methods or the criteria we used to rate the various risk elements. Details of our methodology and rating criteria can be found in our "template" document: ***Pathway-Initiated Pest Risk Assessment: Guidelines for Qualitative Assessments, Version 4.0*** (USDA, 1995); to obtain a copy of our template, contact the individual named in the proposed regulations.

B. Risk Assessment

1. Initiating Event: Proposed Action

This pest risk assessment is commodity-based, and therefore "pathway-initiated"; we initiated the assessment in response to the request for USDA authorization to allow imports of a particular commodity presenting a potential plant pest risk. In this case, the importation of fresh *Cichorium endivia* and *C. intybus* leaves, stems, and roots grown in Ecuador and Nicaragua into the U.S. is a potential pathway for introduction of plant pests. Quarantine 56 (7 CFR §319.56) provides USDA, APHIS regulatory authority for importation of fruits and vegetables.

Cichorium is but one of about 1314 genera within the family Asteraceae. There are about 8 species in the genus. Two species, *Cichorium intybus* and *C. endivia* are used as salad greens. The roots of *C. endivia* may be roasted for a coffee substitute, or dried for medicinal use.

2. Assessment of Weediness Potential of *Cichorium*

Table 1 shows the results of our weediness screening for *Cichorium* . These findings did not require

us to initiate a pest-initiated pest risk assessment.

Table 1: Process for Determining Weediness Potential of Commodity

Commodity: *Cichorium* spp.

Phase 1: *C. intybus*, *C. intybus* var. *foliosum* and *C. endivia* are all established in the U. S.

Phase 2: Is the species listed in:

Yes *Geographical Atlas of World Weeds* (Holm, 1979)

No *World's Worst Weeds* (Holm, 1977)

Yes *Report of the Technical Committee to Evaluate Noxious Weeds; Exotic Weeds for Federal Noxious Weed Act* (Gunn & Ritchie, 1982)

Yes *Economically Important Foreign Weeds* (Reed, 1977)

Yes Weed Science Society of America list (WSSA, 1989)

Yes Is there any literature reference indicating weediness (e.g. , *AGRICOLA* , *CAB* , *Biological Abstracts* , *AGRIS* ; search on "species name" combined with "weed").

Phase 3: Conclusion:

The literature search yielded several articles concerning *C. intybus* and *C. endivia* as weeds. However, the two species are too well established and widespread in the U.S. to be considered as candidates for the Federal noxious weed list. The Geographical Atlas of World Weeds lists *C. pumilum* as a principal weed of Israel, a common weed of Egypt and Lebanon; and, *C. spinosum* is listed as weed in Greece.

3. Previous Risk Assessments, Current Status and Pest Interceptions

3a. Decision history for *Cichorium* :

Cuba - 1926. *Cichorium intybus* - entry permitted subject to inspection.

Colombia - 1956. *Cichorium* spp. - entry permitted subject to inspection.

Belize - 1963. *Cichorium* spp. - entry permitted subject to inspection.

Chile - 1980. *Cichorium* spp. - entry permitted subject to inspection.

West Indies - 1984. *Cichorium* spp. - leaves and stems permitted entry subject to inspection.

Guatemala - 1987. *Cichorium* spp. - above ground parts permitted entry subject to inspection.

Costa Rica - 1988. *Cichorium* spp. - entry permitted subject to inspection.

Honduras - 1990. *Cichorium* spp. - entry permitted of leaves and stems subject to inspection.

Argentina - 1990. *Cichorium* spp. - leaves and stems permitted subject to inspection.

Peru - 1990. *Cichorium* spp. - leaves permitted entry subject to inspection.

Bolivia - 1991. *Cichorium intybus* - leaf buds permitted entry subject to inspection.

3b. Interceptions from FY 85-95

HOST ORIGIN PEST

CICHORIUM INTYBUS (LEAF) Central America SPODOPTERA SP.

CICHORIUM INTYBUS Central America APHIDIDAE, Species of

CICHORIUM SP. (LEAF) Central America AEOLUS SP. (Elateridae)

CICHORIUM SP. (LEAF) Central America HELIX ASPERSA

CICHORIUM SP. Central America AGROMYZIDAE, Species of

CICHORIUM SP. South America AGROMYZIDAE, Species of

CICHORIUM ENDIVIA (LEAF) South America APHIDIDAE, Species of

CICHORIUM ENDIVIA (LEAF) South America COPITARSIA, Species of

CICHORIUM ENDIVIA (LEAF) South America LIRIOMYZA SP.

CICHORIUM ENDIVIA (LEAF) South America NOCTUIDAE, Species of

CICHORIUM INTYBUS (LEAF) South America NOCTUIDAE, Species of

CICHORIUM INTYBUS (LEAF) South America NYSIUS SP.

CICHORIUM SP. (LEAF) South America AGROTIS SP.

CICHORIUM SP. (LEAF) South America ELATERIDAE, Species of

CICHORIUM SP. (LEAF) South America HELICOVERPA SP.

CICHORIUM SP. (LEAF) South America NOCTUIDAE, Species of

CICHORIUM SP. (LEAF) South America NYSIUS SP.

CICHORIUM INTYBUS South America LIRIOMYZA HUIDOBRENSIS

CICHORIUM SP. South America CONODERUS RUFANGULUS

CICHORIUM SP. South America BLAPSTINUS PUNCTULATUS

4. Pest List: Pests Associated with *Cichorium* spp. in Central and South America.

Table 2 shows the pest list for *Cichorium* generated after review of the information sources listed in USDA (1995). The pest list includes limited information on the distribution of each pest, pest-commodity association, and regulatory history.

Table 2: Pest List - *Cichorium* spp. from Central and South America

Scientific Name, Classification	Distribution ¹	Comments ²	References
Arthropods			
<i>Apogonalia grossa</i> Signoret (Homoptera: Cicadellidae)	BR	e	De Menezes, 1978
<i>Leptinotarsa decemlineata</i> (Say) (Coleoptera: Chrysomelidae)	GT,US	c	EPPO DATABASE
<i>Melanophus bivittatus</i> (Say) (Orthoptera: Acrididae)	US	c	Bailey & Mukerji, 1976
<i>Orthocephalus coriaceus</i> Fabricius (Hemiptera: Miridae)	US	c	Wheeler, 1985
<i>Pemphigus bursarius</i> (L.) (Homoptera: Aphididae)	CX,SX,US	c,z	Blackman & Eastop, 1994
<i>Spodoptera ornithogalli</i> (Gn.) (Lepidoptera: Noctuidae)	CX,SX,US	c,z	CIE, 1977
<i>Trichoplusia ni</i> (Hb.) (Lepidoptera: Noctuidae)	NI,SX,US	c,z	CIE, 1974; Ryder, 1979
Fungi			
<i>Alternaria cichorii</i> Nattrass (Deuteromycotina: Hyphomycetes)	AR,US(Florida)	c,f,z	David, 1995
<i>Botrytis cinerea</i> Pers.:Fr. (Deuteromycotina: Hyphomycetes)	Cosmopolitan	c,z	Ryder, 1979; Farr et al., 1989
<i>Bremia lactucae</i> Regel (Oomycetes: Peronosporales)	CX,SX,US	c,z	CMI, 1969; Ryder, 1979; Morgan, 1981
<i>Cercospora cichorii</i> Davis (Deuteromycotina: Hyphomycetes)	AR,BR,US	c,z	Chupp, 1953; ARS Fungal Database

<i>Erysiphe cichoracearum</i> DC (Pyrenomycetes: Erysiphales)	Cosmopolitan	c,z	Ryder, 1979; Farr <i>et al.</i> , 1989
<i>Phoma exigua</i> Desmaz. (Deuteromycotina: Coelomycetes)	Cosmopolitan	c	Farr <i>et al.</i> , 1989
<i>Phymatotrichopsis omnivora</i> (Duggar) Hennebert (Deuteromycotina: Hyphomycetes)	US	c	Farr <i>et al.</i> , 1989
<i>Phytophthora cryptogea</i> Pethybr. & Lafferty (Oomycetes: Peronosporales)	AR,US	c	Stamps, 1978; CMI, 1985
<i>Puccinia hieracii</i> f. sp. <i>cichorii</i> (Bellynck) Boerema & Verhoeven (Basidiomycetes: Agaricales)	CX,SX,US	c,z	Arthur, 1934; Boerema & Verhoeven, 1980
<i>Rhizoctonia solani</i> Kuhn (Deuteromycotina: Agonomycetes)	Cosmopolitan	c	Farr, 1989
<i>Sclerotinia minor</i> Jagger (Discomycetes: Helotiales)	Temperate including U.S.	c,z	Farr, 1989
<i>Sclerotinia sclerotiorum</i> (Lib.) de Bary (Discomycetes: Helotiales)	Worldwide	c,z	Farr, 1989
<i>Thielaviopsis basicola</i> Berk. & Broome Ferraris (Deuteromycotina: Hyphomycetes)	Cosmopolitan	c	Farr, 1989
Bacteria			
<i>Agrobacterium tumefaciens</i> E. F. Smith & Towns.) Conn	CX,SX,US	c	CMI, 1980; Bradbury, 1986
<i>Erwinia carotovora</i> subsp. <i>carotovora</i> (Jones) Bergey	Worldwide	c,z	Bradbury, 1986
<i>Pseudomonas cichorii</i> (Swingle) Stapp	Widespread, US	c,z	Bradbury, 1986
<i>Pseudomonas marginalis</i> pv. <i>marginalis</i> (Brown) Stevens	SX,US	c,z	CMI, 1970; Bradbury, 1986; Moline & Lipton, 1987
Viruses			
Cucumber mosaic virus	AR,BR,US	c,z	Francki <i>et al.</i> , 1979
Tobacco mosaic virus	AR,BR,PE,US	c,z	Zaitlin & Israel, 1975
Tomato spotted wilt virus	SX,US	c,z	Ie, 1970
Nematodes			
<i>Ditylenchus dipsaci</i> (Kuhn) Filipjev	SX,US	c,z	Anon., 1984; Smith <i>et al.</i> , 1988
<i>Meloidogyne arenaria</i> (Neal) Chitwood	CX,SX,US	c,z	Taylor & Sasser, 1978; Anon., 1984
<i>Meloidogyne hapla</i> Chitwood	CX,SX,US	c,z	Taylor & Sasser, 1978; Anon., 1984
<i>Meloidogyne javanica</i> (Treub) Chitwood	CX,SX,US	c,z	Taylor & Sasser, 1978; Anon., 1984

1 Distribution legend: AR = Argentina; BR = Brazil; EC = Ecuador; GT = Guatemala; NI =

Nicaragua; PE = Peru; CX = Central America; SX = South America; US = United States

² Comments: c = Organism does not meet the geographical and regulatory definition for a quarantine pests (NAPPO; FAO)

e = Although pest attacks commodity, it would not be expected to remain with the commodity during processing

f = Pest occurs in the U.S. and is not currently subject to official restrictions and regulations (i.e., not listed as actionable, and no official control program)

z = Pest is known to attack or infest *Cichorium* and it would be reasonable to expect the pest may remain with the commodity during processing and shipping

5. List of Quarantine Pests

Apogonalia grossa was the only pest that met the definition of a quarantine pest; however, this insect is not likely to remain with the product during handling and processing. Hence, the movement of *Cichorium* will not serve as a pathway. Because no quarantine pests were identified as following the pathway no further analysis is required. Consequently this PRA ends at this point with the following proviso: Should any pests intercepted on commercial (or any other) shipments of *Cichorium* be determined to be quarantine pests, action may be taken.

6. Conclusions:

These commodities are currently permitted entry subject to inspection from five Central American and four South American countries in addition to the countries comprising the West Indies. The scope of this assessment was the pests reported on *Cichorium* spp. in Central and South America. Therefore, this pest risk assessment will serve as documentation for any addition requests for *C. endivia* and *C. intybus* from countries within these areas.

C. References

Anonymous. 1984. Distribution of Plant Parasitic Nematode Species in North America. Society of Nematologist. 205 p.

Arthur, J. C. 1934. Manual of the Rusts in the United States and Canada. Science Press Printing, Lancaster, PA. 438 p.

Bailey, C. G. & M. K. Mukerji. 1976. Feeding habits and food preferences of *Melanoplus bivittatus* and *femurrrubrum* (Orthoptera: Acrididae). Canadian Entomologist 108:1207-1212.

Blackman, R. L. & V. F. Eastop. 1994. Aphids on the World's Trees, An Identification and Information Guide. CAB International, UK. 987 p.

Boerema, G. H. & A. A. Verhoeven. 1980. Check-list for scientific names of common parasitic fungi. Series 2d: Fungi on field crops: Vegetables and cruciferous crops. Neth. J. Pl. Path. 86:199-228.

Bradbury, J. F. 1986. Guide to Plant Pathogenic Bacteria. CAB International Mycological Institute. 329 p.

Chupp, C. 1953. A monograph of the fungus genus *Cercospora* . Cornell University. Ithaca, NY.667 p.

CIE. 1974. Distribution Maps of Pests. No. 328 *Trichoplusia ni* Commonwealth Agricultural Bureaux, England.

CIE. 1977. Distribution Maps of Pests. No. 367 *Spodoptera ornithogalli* Commonwealth Agricultural Bureaux, England.

CMI. 1969. Distribution Maps of Plant Diseases. No. 86, *Bremia lactucae* Regel. Commonwealth Agricultural Bureau, England.

CMI. 1970. Distribution Maps of Plant Diseases. No. 357, *Pseudomonas marginalis* (Brown) Stevens. Commonwealth Agricultural Bureau, England.

CMI. 1980. Distribution Maps of Plant Diseases. No. 137 *Agrobacterium tumefaciens* . Commonwealth Agricultural Bureau, England.

CMI. 1985. Distribution Maps of Plant Diseases. No. 99 *Phytophthora cryptogea* Pethybr. & Laff. Commonwealth Agricultural Bureau, England.

De Menezes, M. 1978. Notes on the oviposition habits and the host plants of *Apogonalia grossa* Homoptera Cicadellidae Cicadellinae. Rev. Bras. Entomol. 22:61-64.

David, J. C. 1995. CMI Descriptions of Fungi and Bacteria Number 1221, *Alternaria cichorii* . Commonwealth Agricultural Bureau, England. 2 p.

EPPO. 1994-10. European and Mediterranean Plant Protection Organization, Plant Protection retrieval System, Version 3.0.

FAO. 1995. International Standards for Phytosanitary Measures. Section 1 - Import Regulations: Guidelines for Pest Risk Analysis (Draft Standard). Secretariat of the International Plant Protection Convention of the Food and Agriculture Organization of the United Nations. Rome, Italy.

Farr, D. F.; G. F. Bills; G. P. Chamuris, A. Y. Rossman. 1989. Fungi on Plants and Plant Products in the United States. American Phytopathological Society, St. Paul, MN. 1252 p.

Francki, R. I. B.; D. W. Mossop; T. Hatta. 1979. CMI/AAB Description of Plant Viruses. No. 213 Cucumber Mosaic Virus. Commonwealth Mycological Institute, Surrey, England. 6 p.

Gunn, C.R. and C. Ritchie. 1982. 1982 Report of the Technical Committee to Evaluate Noxious Weeds; Exotic Weeds for Federal Noxious Weed Act. (unpublished).

Holm, L.G., D.L. Plucknett, J.V. Pancho and J.P. Herberger. 1977. The World's Worst Weeds. University of Hawaii Press, Honolulu.

Holm, L.G., J.V. Pancho and J.P. Herberger and D.L. Plucknett. 1979. A Geographical Atlas of World Weeds. John Wiley and Sons, New York.

Ie, T. S. 1970. CMI/AAB Descriptions of Plant Viruses. No. 39 Tomato Spotted Wilt Virus. Commonwealth Mycological Institute, Surrey England. 4 p.

Moline, H. E. & W. J. Lipton. 1987. Market Diseases of Beets, Chicory, Endive, Escarole, Globe Artichokes, Lettuce, Rhubarb, Spinach, and Sweetpotatoes. Ag. Handbook Number 155, USDA. 86 P.

Morgan, W. M. 1981. CMI Descriptions of Pathogenic Fungi and Bacteria, Number 682, *Bremia lactucae*. Commonwealth Mycological Institute, England. 3. p.

NAPPO/FAO. 1995. NAPPO/FAO glossary of phytosanitary terms. North American Plant Protection Organization (NAPPO) and United Nations Food and Agriculture Organization (FAO). NAPPO Secretariat, Ottawa, Ontario, Canada.

Reed, C.F. 1977. Economically Important Foreign Weeds. Agriculture Handbook No. 498

Ryder, E. J. 1979. Leafy Salad Vegetables, AVI Publishing Company, Inc. Conn. 266 p.

Smith, I. M.; J. Dunez; R. A. Lelliott; D. H. Phillips; & S. A. Archer. 1988. European Handbook of Plant Diseases, Blackwell Scientific Publication, London, England. 583 p.

Stamps, D. J. 1978. CMI Descriptions of Pathogenic Fungi and Bacteria Number 593, *Phytophthora cryptogea*. Commonwealth Mycological Institute, England. 2 p.

Taylor, A. L. & J. N. Sasser. 1978. Biology, Identification and Control of Root-Knot Nematodes (Meloidogyne Species). North Carolina State University Graphics. 111 p.

Wheeler, A. G. Jr. 1985. Seasonal history, host plants, and nymphal descriptions of *Orthocephalus coriaceus*, a plant bug pest of herb garden composites (Hemiptera: Miridae). Proc. of the Entomological Society of Washington 87:85-93.

USDA. 1995. Pathway-Initiated Pest Risk Assessment: Guidelines for Qualitative Assessments, Version 4.0. PPQ, APHIS. 15 p.

USDA,ARS Fungal Databases. 1996. U.S. National Fungus Collections. Systematic Botany and Mycology Laboratory. USDA, Agricultural Research Service, Beltsville, MD.

WSSA, 1989. Composite List of Weeds. Weed Science Society of America.

Zaitlin, M. & H. W. Israel. 1975. CMI/AAB Descriptions of Plant Viruses. No. 151, Tobacco Mosaic Virus. Commonwealth Mycological Institute, Surrey, England. 5 p.

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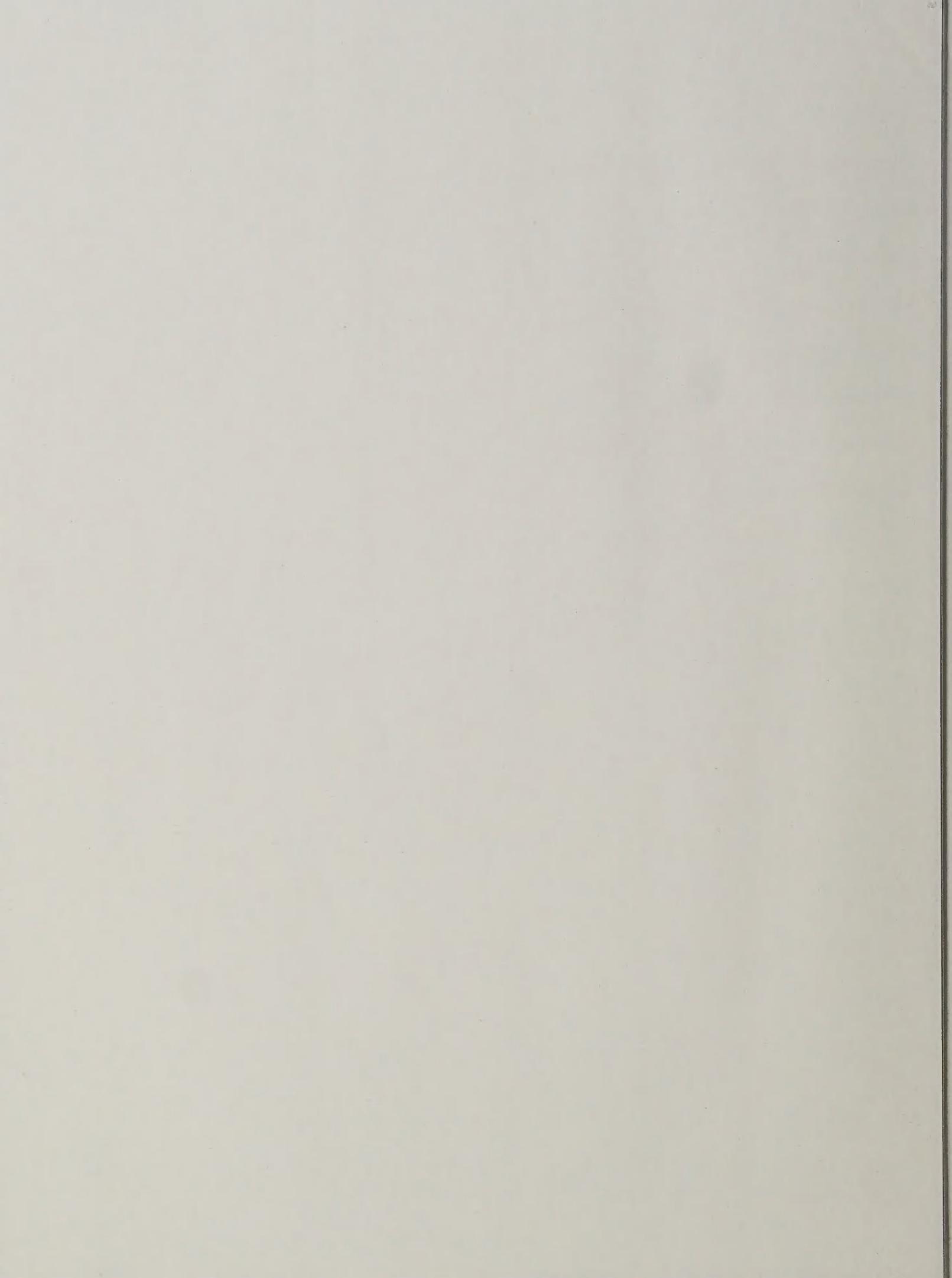
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